REMARKS

Applicant requests favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

To place the application in better form, Applicant submits herewith a substitute specification, which includes a new abstract. For the Examiner's convenience, also provided is a marked-up copy of the original specification showing the portions thereof which are being changed. The substitute specification includes the same changes as are indicated in the marked-up copy. Applicant's undersigned attorney has reviewed the substitute specification and submits that the substitute specification contains no new matter.

Claims 17-32 are presented for consideration in lieu of claims 1-16, which have been canceled without prejudice or disclaimer. Claims 17, 30 and 32 are independent. Support for these claims can be found in the original application, as filed. Accordingly, no new matter has been added.

Applicant requests favorable reconsideration and withdrawal of the rejections set forth in the above-noted Office Action.

Claim 3 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner asserted that the phrase "a plurality of the first marks" in line 2 of this claim lacked proper antecedent basis. Claim 3 having been canceled, this rejection has become moot and should be withdrawn. Such favorable indication is requested.

Claims 1-16 were rejected under the judicially created doctrine of statutory type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 6,949,755. Applicant submits that claims 1-15 of the '755 patent do not teach or suggest many features of the present invention as previously recited in claims 1-16. Therefore, this rejection is respectfully traversed.

Applicant further submits that claims 1-15 of the '755 patent do not teach or suggest many features of the present invention as recited in pending claims 17-32. Specifically, claims 1-15 of the '755 patent set forth an extraction of a first mark and a feature from a first image (low magnification) and detection of a target mark, based on the first mark position and the feature. In marked contrast to this arrangement, the present invention provides for extraction of a first mark position and a feature from a first image (low magnification), (i) identification of the first marked based on the first mark feature, (ii) extraction of a target mark position from a second image (high magnification), (iii) evaluation of a reliability of the target mark position, and (iv) selection of a second mark as a new target mark different from the target mark based on the evaluated reliability and the extracted first mark, in order to extract the selected second mark position from the high magnification image. Applicant submits that such features of the present invention are not claimed in the '755 patent.

The Examiner asserts that the claims of the '755 patent discuss a plurality of marks, which would anticipate Applicant's pending claims. Applicant submits, however, that the '755 patent merely claims detection of a target mark, which is included in the plurality of marks. Thus, Applicant submits that the feature of the target mark changing, namely, the selection of the second mark as the new target mark in the present invention would not be anticipated by the claims of the '755 patent.

For the reasons noted above, Applicant submits that the present invention, as recited in independent claims 17, 30 and 32, for example, is patentably defined over the claims in the '755 patent.

Turning now to the art rejection, claims 1-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,249,016 to Tanaka. Applicant submits that the cited

art does not teach or suggest many features of the present invention, as previously recited in 1-16. Therefore, this rejection is respectfully traversed. Nevertheless, Applicant submits that independent claims 17, 30 and 32, for example, as presented, amplify the distinctions between the present invention and the cited art.

In one aspect of the present invention, independent claim 17 recites an apparatus for detecting a position of a target mark out of a plurality of marks in a region of an object to obtain a position of the region of the object. The apparatus include a scope configured to sense a first image of the object at a first magnification and a second image of the object at a second magnification higher than the first magnification, and a processor configured to extract, from the first image, a position of a first mark out of the plurality of marks and a feature of a region outside the first mark, to identify the first mark based on the extracted feature, to extract, from the second image, a position of the target mark, to evaluate reliability of the extracted position of the target mark, to select a second mark, different from the target mark, from the plurality of marks as a new target mark based on the evaluated reliability and the identified first mark, in order to extract a position of the selected second mark from an image sensed by the scope at the second magnification.

In another aspect of the present invention, independent claim 30 recites an exposure apparatus for exposing a substrate to a pattern. The apparatus detects a position of a target mark out of a plurality of marks in a region of the substrate to obtain a position of the region of the substrate. The apparatus includes a stage configured to mount the substrate and to move, a scope configured to sense a first image of the substrate at a first magnification and a second image of the substrate at a second magnification higher than the first magnification, a processor configured to extract, from the first image, a position of a first mark out of the plurality of marks

and a feature of a region outside the first mark, to identify the first mark based on the extracted feature, to extract, from the second image, a position of the target mark, to evaluate reliability of the extracted position of the target mark, to select a second mark, different from the target mark, from the plurality of marks as a new target mark based on the evaluated reliability and the identified first mark in order to extract a position of the selected second mark from an image sensed by the scope at the second magnification, and a controller configured to control a position of the stage based on the extracted position of the second mark.

In a further aspect of the present invention, independent claim 32 recites a method of detecting a position of a target mark out of a plurality of marks in a region of an object to obtain a position of the region of the object. The method includes steps of sensing a first image of the object at a first magnification, sensing a second image of the object at a second magnification higher than the first magnification, extracting, from the first image, a position of a first mark out of the plurality of marks and a feature of a region outside the first mark, identifying the first mark based on the extracted feature, extracting, from the second image, a position of the target mark, evaluating reliability of the extracted position of the target mark, selecting a second mark, different from the target mark, from the plurality of marks as a new target mark based on the evaluated reliability and the identified first mark, and extracting a position of the selected second mark from an image sensed at the second magnification.

Applicant submits that the cited art does not teach or suggest such features of the present invention, as recited in independent claims 17, 30 and 32.

The Examiner relies on the Tanaka patent for discussing an apparatus/method which detects a position of a target mark included in an object, including a unit CU, which senses an image of the object WF, a unit OE which extracts a first mark (pre-alignment mark

WAMR/WAML) and a feature (WMR/WML) of a region outside of the first mark in the image, and the unit CU, which selects a second mark (WAMR/WAML), and a unit CM.

Applicant submits, however, that the Tanaka patent does not teach or suggest many features of Applicant's present invention, as recited in the independent claims. Notably, Applicant submits that the Tanaka patent does not teach or suggest at least the feature of (i) identification of a first mark based on a first mark feature. In this regard, the Examiner points out that the first mark and the feature correspond to the pre-alignment marks (WAMR/WAML) and the alignment marks (WMR/WML) in the shot area, respectively. According to the Tanaka patent, however, the pre-alignment marks are not identified by the alignment marks in the shot area. Thus, Applicant submits that the Tanaka patent does not teach or suggest at least the feature of (i) identification of a first mark based on a first mark feature, in the manner of the present invention recited in the independent claims.

Still further, Applicant submits that the Tanaka patent also does not teach or suggest at least the feature of (iv) selection of a second mark as a new target mark different from the target mark based on the evaluated reliability and the extracted first mark, in order to extract the selected second mark position from the high magnification image. Accordingly, the Tanaka patent does not teach or suggest these features of the present invention, as recited in the independent claims, as well.

For the foregoing reasons, Applicant submits that the present invention, as recited in independent claims 17, 30 and 32, is patentably defined over the cited art.

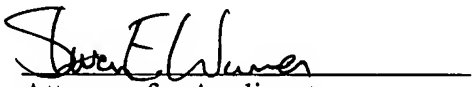
Dependent claims 18-29 and 31 also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in their

respective independent claims. Further individual consideration of these dependent claims is requested.

Applicant submits that the instant application is in condition for allowance. Accordingly, Applicant requests favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action and an early Notice of Allowance.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,



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